AMENDMENTS TO THE CLAIMS

This listing of claims will replace all prior versions and listings of claims in the application:

1. (currently amended) A method of producing a glass substrate for a mask blank, said mask blank being for use in a transfer mask which is for use with ~~F2 excimer laser light or~~ EUV (extreme ultra violet) light as an exposure light source, said glass substrate being made of a SiO_2-TiO_2 glass, the method comprising:

a profile measuring step of measuring a convex/concave profile of a surface of the glass substrate for a mask blank;

a flatness control step of controlling a flatness of the surface of the glass substrate to a value not greater than a reference flatness required in lithography using ~~the F2 excimer laser light or~~ the EUV light as the exposure light source by specifying the degree of convexity of a convex portion present on the surface of the glass substrate with reference to a result of measurement obtained in the profile measuring step and by executing local machining upon the convex portion under a machining condition depending upon the degree of convexity; and

a non-contact polishing step of polishing, after the local machining of the flatness control step, the surface of the glass substrate subjected to the local machining by the action of a machining liquid interposed between the surface of the glass substrate and a surface of a polishing tool without direct contact therebetween;

the local machining being carried out by plasma etching, a gas cluster ion beam, or MRF (Magnetorheological Finishing);

the non-contact polishing step being carried out by at least one of float polishing, elastic emission machining (EEM), and hydroplane polishing.

2. (currently amended) A method of producing a glass substrate for a mask blank, said glass substrate being made of a SiO_2-TiO_2 glass, the method comprising:

a profile measuring step of measuring a convex/concave profile of a surface of the glass substrate for a mask blank;

a flatness control step of controlling a flatness of the surface of the glass substrate to a value not greater than 0.25 μm by specifying the degree of convexity of a convex portion present on the surface of the glass substrate with reference to a result of measurement obtained in the profile measuring step and by executing local machining upon the convex portion under a machining condition depending upon the degree of convexity; and

a non-contact polishing step of polishing, after the local machining of the flatness control step, the surface of the glass substrate subjected to the local machining by the action of a machining liquid interposed between the surface of the glass substrate and a surface of a polishing tool without direct contact therebetween;

the local machining being carried out by ~~at least one of~~ plasma etching, a gas cluster ion beam, or MRF (Magnetorheological Finishing);

the non-contact polishing step being carried out by at least one of float polishing, elastic emission machining (EEM), and hydroplane polishing.

3. (previously presented): A method according to claim 1, wherein:

the machining liquid used in the non-contact polishing step comprises:

an aqueous solution selected from water, an acidic aqueous solution, and an alkaline aqueous solution; or

a mixture of the aqueous solution and at least one kind of fine powder particles selected from colloidal silica, cerium oxide, zirconium oxide, and aluminum oxide.

4. (canceled).

5. (previously presented): A method according to claim 1, wherein the reference flatness is not greater than 0.25 μm.

6. (previously presented) A method of producing a mask blank, the method comprising the steps of preparing the glass substrate obtained by the method according to claim 1, and forming a thin film as a transferred pattern on the glass substrate.

7. (original) A method of producing a transfer mask, the method comprising the steps of preparing the mask blank obtained by the method according to claim 6 and patterning the thin film of the mask blank to form a thin film pattern on the glass substrate.

8. (original) A method of producing a semiconductor device, the method comprising the steps of preparing the transfer mask obtained by the method according to claim 7 and transferring the thin film pattern of the transfer mask onto a semiconductor substrate by lithography.

9. (previously presented) A method of producing a reflective mask blank, the method comprising the steps of preparing the glass substrate obtained by the method according to claim 1, forming a reflective multilayer film on the glass substrate, and forming a light absorber film on the reflective multilayer film to obtain the reflective mask blank.

10. (previously presented) A method according to claim 2, wherein:

the machining liquid used in the non-contact polishing step comprises:

an aqueous solution selected from water, an acidic aqueous solution, and an alkaline aqueous solution; or

a mixture of the aqueous solution and at least one kind of fine powder particles selected from colloidal silica, cerium oxide, zirconium oxide, and aluminum oxide.

11. (previously presented) A method of producing a mask blank, the method comprising the steps of preparing the glass substrate obtained by the method according to claim 2, and forming a thin film as a transferred pattern on the glass substrate.

12. (previously presented) A method of producing a transfer mask, the method comprising the steps of preparing the mask blank obtained by the method according to claim 11 and patterning the thin film of the mask blank to form a thin film pattern on the glass substrate.

13. (previously presented) A method of producing a semiconductor device, the method comprising the steps of preparing the transfer mask obtained by the method according to claim 12 and transferring the thin film pattern of the transfer mask onto a semiconductor substrate by lithography.

14. (previously presented) A method of producing a reflective mask blank, the method comprising the steps of preparing the glass substrate obtained by the method according to claim 2, forming a reflective multilayer film on the glass substrate, and forming a light absorber film on the reflective multilayer film to obtain the reflective mask blank.